ATTACHMENT A

NON-IMPAIRMENT DETERMINATION

NON-IMPAIRMENT DETERMINATION

By enacting the NPS Organic Act of 1916 (Organic Act), Congress directed the U.S. Department of the Interior and the NPS to manage units "to conserve the scenery and the natural and historic objects and wild life therein and to provide for the enjoyment of the same in such a manner and by such a means as will leave them unimpaired for the enjoyment of future generations" (16 USC § 1). Congress reiterated this mandate in the Redwood National Park Expansion Act of 1978 by stating that NPS must conduct its actions in a manner that will ensure no "derogation of the values and purposes for which these various areas have been established, except as may have been or shall be directly and specifically provided by Congress" (16 USC 1a-1).

NPS Management Policies 2006, Section 1.4.4, explains the prohibition on impairment of park resources and values:

> While Congress has given the Service the management discretion to allow impacts within parks, that discretion is limited by the statutory requirement (generally enforceable by the federal courts) that the Park Service must leave park resources and values unimpaired unless a particular law directly and specifically provides otherwise. This, the cornerstone of the Organic Act, establishes the primary responsibility of the National Park Service. It ensures the Park resources and values will continue to exist in a condition that will allow the American people to have present and future opportunities for enjoyment of them.

The NPS has discretion to allow impacts on Park resources and values when necessary and appropriate to fulfill the purposes of a Park (NPS 2006 sec 1.4.3). However, the NPS cannot allow an adverse impact that will constitute impairment of the affected resources and values (NPS 2006 sec 1.4.3). An action constitutes impairment when its impacts "harm the integrity of Park resources or values, including the opportunities that otherwise will be present for the enjoyment of those resources or values" (NPS 2006 sec 1.4.5). To determine impairment, the NPS must evaluate the "particular resources and values that will be affected; the severity, duration, and timing of the impact; the direct and indirect effects of the impact; and the cumulative effects of the impact in question and other impacts: (NPS 2006 sec 1.4.5).

What is Impairment?

NPS *Management Policies 2006*, Section 1.4.5, *What Constitutes Impairment of Park Resources and Values*, and Section 1.4.6, *What Constitutes Park Resources and Values*, provides an explanation of impairment.

> Impairment is an impact that, in the professional judgment of the responsible National Park Service manager, would harm the integrity of park resources or values, including the opportunities that otherwise would be present for the enjoyment of those resources and values.

The NPS has discretion to allow impacts on Park resources and values when necessary and appropriate to fulfill the purposes of a Park (NPS 2006 sec. 1.4.3). However, the NPS cannot allow an adverse impact that would cause impairment of the affected resources and values (NPS 2006 sec. 1.4.3).

Section 1.4.5 of *Management Policies 2006* states:

> An impact to any park resource or value may, but does not necessarily, constitute impairment. An impact would be more likely to constitute impairment to the extent that it affects a resource or value whose conservation is:

- Necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the park

- Key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park, or

- Identified as a goal in the park's general management plan or other relevant NPS planning documents as being of significance.

An impact would be less likely to constitute an impairment if it is an unavoidable result of an action necessary to preserve or restore the integrity of park resources or values and it cannot be further mitigated.

Per Section 1.4.6 of *Management Policies 2006*, park resources and values that may be impaired include:

- the park's scenery, natural and historic objects, and wildlife, and the processes and condition that sustain them, including, to the extent present in the park: the ecological, biological, and physical processes that created the park and continue to act upon it; scenic features; natural visibility, both in daytime and at night; natural landscapes; natural soundscapes and smells; water and air resources; soils; geological resources; paleontological resources; archeological resources; cultural landscapes; ethnographic resources; historic and prehistoric sites, structure, and objects; museum collections; and native plants and animals;

- appropriate opportunities to experience enjoyment of the above resources, to the extent that can be done without impairing them;

- the park's role in contributing the national dignity, the high public value and integrity, and the superlative environmental quality of the national park system, and the benefit and inspiration provided to the American people by the national park system; and

- any additional attributes encompassed by the specific values and purposes for which the park was established.

Impairment may result from NPS activities in managing the park, visitor activities, or activities undertaken by concessionaires, contractors, and others operating in the park. Impairment may also result from sources or activities outside the park, but this would not be a violation of the Organic Act unless the NPS was in some way responsible for the action.

How is an Impairment Determination Made?

Section 1.4.7 of *Management Policies 2006* states,

> "[i]n making a determination of whether there would be an impairment, an NPS decision-maker must use his or her professional judgment. This means that the decision-maker must consider any environmental assessments or environmental impact statements required by the National Environmental Policy Act of 1969 (NEPA); consultations required under Section 106 of the National Historic Preservation Act (NHPA); relevant scientific and scholarly studies; advice or insights offered by subject matter experts and

> others who have relevant knowledge of experience; and the results of civic engagement and public involvement activities relating to the decision."

Management Policies 2006 further define "professional judgment" as:

> "a decision or opinion that is shaped by study and analysis and full consideration of all relevant facts, and that takes into account the decision-maker's education, training and experience; advice or insights offered by subject matter experts and others who have relevant knowledge and experience; good science and scholarship; and, whenever appropriate, the results of civic engagement and public involvement activities relation to the decision."

Impairment Determination for the Selected Alternative

This determination of impairment has been prepared for the selected alternative described in this ROD. An impairment determination is made for all resource impact topics analyzed for the selected alternative. An impairment determination is not made for visitor experience, socioeconomics, human health and safety, other agency land use plans or policies, and park operations because impairment findings relate back to park resources and values. These impact areas are not generally considered to be park resources or values, and cannot be impaired in the same way.

Geology

Many unique geologic formations are found throughout the parks, including the regionally significant valley-and-ridge formations and the renowned feature of the Delaware Water Gap. Additionally, the limestone formations located within the parks are the foundation of many rare and unique vegetation communities that support several special-status species. Karst geology and shale contribute to unique geologic features including sinkholes, sinking streams, springs, and small caves. The geologic features throughout DEWA contribute to the park's significance because the geologic resources form some of the best-known scenic landscapes in the northeastern United States and illustrate the characteristic landforms and biotic areas of the Appalachian Ridge and Valley Province and the Southern Appalachian Plateau Province. Several of the geologic formations found within the study area are also rich in fossils and several known paleontological sites have been identified.

The selected alternative will result in adverse impacts on geology, topography, and paleontological resources from the installation of towers in areas with a high slope, in unstable or weathered areas, and areas containing limestone and shale. Additional adverse impacts will result from the potential for nearby surface water or groundwater features to be affected; changes to slope and grade; leveling areas with steep slopes that cannot be restored; the potential for changes or disturbance of paleontological resources from drilling and excavation activities; and the installation of towers in fossil-rich geologic formations. The effects of drilling in limestone will create the opportunity for ground vibrations to cause fracturing of the limestone. The required drilling has the potential to connect existing solution features in the limestone and possibly change the groundwater flow path. This, however, is considered unlikely since shallow drilling may not intercept the water table. The probabilities of boreholes intercepting solution features (which typically make up only 1-10% of the saturated rock mass, and usually closer to 1%) is extremely low, and a cross-connection over the short depth of the foundation drilling is unlikely to change the greater groundwater flow regime, especially since the boreholes will be filled by grouting for foundations. Vegetation clearing and maintenance will have adverse impacts on paleontological sites from an increase in accessibility and visibility following the removal of vegetation. Vegetation clearing and maintenance will result in increased collection or vandalism of resources, which will adversely impact paleontological resources.

Although impacts to geologic resources will be significant, the adverse impacts will not result in impairment. The impacts to geologic resources will occur entirely within the ROW corridor and will be limited to specific locations where towers will be installed. The adverse impacts to geologic resources consist primarily of loss of geologic material through drilling, excavation, and grading, and potential loss of some paleontological resources that may be exposed by vegetation clearing. As noted above, there is potential for drilling to fracture limestone and change groundwater flow but the risk is reduced because the drilling will be relatively shallow. Cumulative impacts of the selected alternative and other projects are adverse and may be significant; however, the selected alternative does not alter the level of cumulative impacts. These adverse impacts will not change the overall integrity of the geologic formations and paleontological resources, nor will the adverse impacts to geologic resources substantially change the scenic landscapes of the Appalachian Ridge and Valley Province and the Southern Appalachian Plateau Province which contribute to the significance of DEWA. The visitor experience, the geologic resources and scenic landscapes of the parks, including the Delaware Water Gap, will remain substantially the same.

Floodplains

Naturally functioning floodplains provide habitat for vegetation and wildlife, provide flood and sedimentation control, support the maintenance of water quality, and aid in transport and deposition of sediment and nutrients within riverine systems. In DEWA and MDSR, floodplains serve to slow and store water during flooding. The floodplain within DEWA and MDSR lies along the entire length of the Delaware River and at the confluences of larger tributaries to the Delaware River and is relatively intact with little development or manipulation. Floodplain functions and values, such as storing floodwaters and minimizing erosion of adjacent soils provides riparian habitat that is intrinsic to floodplains and cannot be easily duplicated or replaced. There are no floodplains located within the proposed project area within APPA.

The selected alternative will have adverse impacts on floodplains due to the loss of some floodplain functions and values by reducing the amount and/or changing the composition of floodplain habitat and increasing the potential for soil erosion. However, the selected alternative will not impair floodplains. The clearing of vegetation in the ROW in the floodplain during construction and vegetation maintenance, will adversely affect natural floodplain values (which include vegetation) that contribute to ecosystem quality. However, the clearing of vegetation in the ROW in floodplain areas will not alter floodplain storage or obstruct floodwaters. Vegetation clearing will be avoided in sensitive areas such as riparian corridors along the Delaware River, which support floodplain vegetation. Specifically, vegetation will not be cleared in the floodplain in the 50-foot buffer near intermittent streams and wetlands or in the 100-foot buffer near perennial waterways such as the Delaware River (PPL and PSE&G 2008, 7). Two towers will be partially located within the floodplain of Bushkill Creek and Sand Hill Creek. The construction of these support structures for the transmission line will not result in any increase in flood hazard either as a result of increased flood elevations or changes in flow carrying capacity of any of the streams being crossed by the overhead lines. However, portions of the access roads required for maintenance and construction purposes will be located in some floodplain areas. Mitigation measures will be implemented and will minimize the potential of flooding or adverse impacts on floodplains. BMPs will be used during construction activities, and certain areas will be re-vegetated per the vegetation plans developed by the applicant and approved by the NPS to reduce erosion into streams, wetlands, and floodplains. Overall, the adverse impacts of the selected alternative will be localized and will be effectively mitigated to protect floodplain function through the implementation of BMPs and required consultation and permitting. The largely unimpeded functions and values of the floodplains will continue and the quality and quantity of the river will remain in good condition and continue to provide a stable ecological environment and recreational opportunities for park visitors.

Wetlands

Wetlands have unique functions and values, including groundwater recharge, stormwater storage and discharge, and unique habitats, that are intrinsic to wetlands and cannot be easily duplicated or replaced. Wetlands are not specifically identified in the enabling legislation, park purpose, or the parks' GMP as being significant; however, preserving the natural, cultural, and scenic resources contributing to public enjoyment is one of the purposes of DEWA and APPA. The selected alternative will have adverse impacts to a total of 12 wetlands including palustrine emergent, scrub-shrub, and forested wetlands. Wetlands also include the Hogback Ridge, Arnott Fen, and Van Campens wetland complex which are characterized as rare and unique communities as well as *Exceptional Value Wetlands* because they support endangered species habitat.

Overall, the selected alternative will require construction and vegetation clearing and maintenance activities that will impact 9.28 acres of forested wetlands through the conversion to scrub-shrub and/or emergent wetlands and construction of access roads, tower foundations and crane pads. Although fill will not be placed in wetland areas during vegetation removal and maintenance activities, habitat conversion is considered a wetland impact because some of the wetland functions and values will change including fish and wildlife productivity and habitat, threatened and endangered species habitat, vegetation habitat, water purification, and streamflow. Access roads, tower foundation, and crane pad construction will affect 1.02 acres of wetlands, including wetlands that support rare and unique communities. The removal or felling of trees in forested wetland areas or shrubs in scrub shrub wetlands will increase the amount of open canopy in wetland areas. Open canopy facilitates the growth and spread of nonnative invasive plants, which spread into forested or scrub shrub wetland areas.

The selected alternative will have adverse impacts to wetlands that may be significant, and contributes to cumulative adverse impacts on wetlands when combined with the impacts of other projects. However, the selected alternative will not impair wetlands. As noted above, the adverse impacts consist primarily of conversion from one wetland type to a different wetland type, with corresponding changes in functions, as well as increased potential for spread of non-native invasive plants. However, the selected alternative will not result in conversion of wetland to non-wetland. Further, under the selected alternative, the permanent ROW is reduced to a consistent 200-foot width, which greatly reduces the unavoidable impacts to wetlands. The selected alternative incorporates additional mitigation measures to reduce adverse impacts to wetlands, such as requiring buffers surrounding wetlands where no construction activities will occur, limiting construction to winter months when most plants are dormant, and using mats and wide track vehicles when crossing wetlands. In addition, in order to implement the "no net loss of wetlands" policy and the goal of net gain for wetlands, Director's Order #77-1 states that for new actions where impacts on wetlands cannot be avoided, proposals must include plans for compensatory mitigation that restore wetlands on NPS lands at a minimum acreage ratio of 1 to 1 for the selected alternative. The final Statement of Findings (attached) requires mitigation measures for wetlands, including compensatory mitigation above the minimum acreage ratio. As a result of these mitigation measures, the wetlands will remain in substantially similar condition and quantity as at present and the visitor experience of the wetlands will remain substantially the same.

Vegetation

Vegetation is part of a larger, continuous, diverse ecosystem within the Delaware River valley upon which other resources are dependent. Vegetation contributes to DEWA's significance as open space, which combined with other regional protection and preservation initiatives, creates a multistate greenway corridor that preserves essential habitat for the sustained health of plant and animal communities, including potentially threatened species in the region. DEWA is one of the largest public open spaces remaining in the northeastern metropolitan corridor, with nearly 90% of its land remaining undeveloped.

Nearly 54,000 acres of forested habitat is located within DEWA. APPA is significant as it is a 2,175 mile trail, that is continuous from Maine to Georgia, for travel on foot through the wild, scenic, wooded, pastoral, and culturally significant lands of the Appalachian Mountains. The proposed project area contains a mix of vegetation communities reflecting wet, moist, and xeric conditions and is considered one of the most undeveloped areas of the park. Vegetation within the existing ROW is typical of a scrub shrub area, dominated by herbaceous and shrub species. The habitat on either side of the existing ROW consists of deciduous, coniferous, and mixed forest stands and contains large swaths of contiguous mature forest with few manmade intrusions. Additionally, invasive plant species are currently present in the existing ROW and surrounding habitat.

Vegetation will be removed from expanding the right-of-way (ROW) for construction of the Susquehanna to Roseland 500-kV transmission line (S-R line). Areas cleared for access roads (inside and outside the ROW) and tower foundations (inside the ROW) will be maintained permanently and will result in a permanent loss of vegetation. Invasive plant and wildlife species have the potential to spread as a result of vegetation removal and disturbance. Additionally, new invasive species may colonize an area where they were previously absent. Overall, adverse impacts on vegetation will result from vegetation clearing, the construction of the proposed double 500-kV transmission line, the deconstruction of the existing transmission line, the potential spread of invasive species, and vegetation management for the operation of the S-R Line. Collectively, these impacts will reduce the abundance, diversity, and quality of native vegetation within the right of way and access roads. The cumulative impacts are also adverse when combined with the adverse impacts of other projects, although the selected alternative will not alter the level of impact compared to the other projects.

The impacts of the selected alternative on vegetation have the potential to be significant since the affected area contains high concentrations of many important and unique natural features including the Arnott Fen, the Delaware River riparian corridor, eastern hemlock forests, the Hogback Ridge, the Kittatinny Ridge, and the Van Campens Brook riparian area; however, the selected alternative will not impair these resources. As noted above, vegetation clearing will be kept to the minimum needed to accomplish construction and meet NERC standards. In addition, vegetation removal in sensitive areas such as wetlands and the Delaware River riparian corridor will be avoided to the extent feasible and no clearing will occur in designated buffer zones around wetlands and the riparian corridor. To reduce the permanent loss of vegetation, disturbed areas, except for access roads and tower foundations, will be seeded after construction with an NPS-approved conservation seed mixture appropriate to the local conditions. With the establishment of a consistent ROW width of 200 feet along the corridor, the areas adjacent to the ROW will be allowed to succeed to mature forest. Areas inside the ROW that do not need to be maintained for operation of the S-R Line will also be allowed to succeed to forested area over time. These mitigation measures are expected to effectively reduce adverse impacts by decreasing the loss of native vegetation, controlling the spread of invasive species, protecting native vegetation and sensitive communities, and restoring disturbed areas after construction. Thus, while the selected alternative will result in localized changes in vegetation along the ROW, vegetation resources will not be impaired as the narrower permanent ROW will restore and maintain the large blocks of contiguous vegetation adjacent to the corridor and some of the vegetation changes within the ROW will be reversed over time, as areas both outside and inside the ROW are allowed to succeed to forest. Future generations will be able to experience vegetation resources in the area in substantially the same condition as at present.

Landscape Connectivity, Wildlife, and Wildlife Habitat

Landscape connectivity is essential for healthy wildlife populations, especially for those species that are highly mobile and have large home-range requirements. The connection between the parks and other public and undeveloped lands creates a larger area for wildlife that provides a refuge amidst increasing development. Connectivity is also a recreational asset, providing visitors an opportunity for a

backcountry experience. Large tracts of hardwood forests dominated by oaks and coniferous forests dominated by eastern hemlock are prevalent within DEWA. The forests of DEWA, including those surrounding APPA, provide some of the increasingly rare forest interior of the mid-Atlantic region. Currently, the cleared area of the B-K Line ROW ranges from 80 to 100 feet wide and creates a linear tract from east to west across one of the widest portions of DEWA. The ROW also crosses the MDSR and APPA.

Permanent habitat loss under the selected alternative will result from the construction of access roads, the widening of the proposed ROW along one section of the corridor, and the construction of tower foundations. The impacts on wildlife habitat from fragmentation include the loss of habitat, reduced habitat patch size, increased edge, and increased isolation of patches. The adverse impacts of the selected alternative also contribute to adverse cumulative impacts on landscape connectivity, wildlife and wildlife habitat when combined with the adverse impacts of other utility ROWs that currently exist inside and outside the study area.

The adverse impacts of the selected alternative on landscape connectivity, wildlife, and wildlife habitat have the potential to be significant due to further fragmentation of land and reduced wildlife habitat; however, the selected alternative will not impair these resources. The transmission line will be sited along an existing ROW, which already fragments the existing habitat and will be in a localized area when compared to the remaining habitat at the parks. Further, the permanent ROW will have a consistent width of 200 feet, which is similar to the existing width in some areas and less than the existing width in other areas. To reduce adverse impacts, the selected alternative incorporates mitigation measures such as imposing seasonal restrictions for maintenance activities, leaving brush piles adjacent to the ROW, and removing spur roads following construction. To reduce the amount of permanent habitat loss, all disturbed areas will be seeded after construction with an NPS-approved conservation seed mixture appropriate to the local conditions. None of the mitigation measures will eliminate impacts on landscape connectivity, wildlife habitat, or wildlife; however, they will reduce the impacts on these resources by decreasing the loss of habitat and preventing the take of bird nests and direct mortality of wildlife species. In addition, establishing a consistent ROW width of 200 feet, which is narrower than the existing ROW in many areas, will reduce permanent fragmentation and allow the majority of the construction area to succeed to forest over time. Thus, the selected alternative will not impair landscape connectivity, wildlife and wildlife habitat because, although the adverse impacts may be significant in the short term, the intensity of the impacts will be reduced by mitigation and in the long term, landscape connectivity and wildlife habitat will be restored and maintained in similar condition and quality as currently exists.

Special-status Species

Maintaining the integrity of local populations of state and federally-listed species and their habitat, is important because listed species are rare, have specialized habitat requirements, and because the parks serve as a refuge from surrounding habitat loss and alteration due to development pressure in the region. The presence and viewing of special-status species, such as the bald eagle, is an important component to the visitor experience that is not commonly available in adjacent developed areas. The alignment proposed for the selected alternative is one of the most undeveloped areas of the park which provides unique and important high-quality habitat for special-status species. The proposed alignment for the selected alternative includes habitat for 50 special status species. In addition, the transmission line will bisect a major migratory bird flyway and is adjacent to an important communal roost for wintering bald eagles that is one of only two known winter roosts in DEWA.

The selected alternative will have adverse impacts to state listed aquatic species from the removal of vegetation near surface waters which could alter habitat conditions by reducing land-based food sources, increasing water temperatures, changing light attenuation, and exposing streambanks and shorelines to

erosion. Clearing and construction activities will result in the physical removal of vegetation that could include plant communities that could support the Argos skipper. Neotropical migrant bird species, summer resident species, special-status raptor species, and nesting bald eagles that use forested habitat could be adversely affected by the loss of trees including the loss of potential nesting habitat. The transmission line will be oriented perpendicular to a major flyway for migratory birds, creating an aerial hazard and increasing the risk of bird collisions. The removal of vegetation, specifically clearing of forested areas that will increase sun exposure and reduce forest canopy, will destroy or reduce selected habitat of special-status reptile and amphibian species. In addition, individuals (or eggs) may be crushed or killed as a result of their inability to avoid contact with construction vehicles, equipment, and materials during vegetation clearing and construction activities. Construction activities could also lead to perceptible or measurable changes in bobcat behavior, den use, or the location or size of a territory. Summer habitat and foraging habitat for all three species of bats is present in the study area and could be affected by the removal of trees, which may contain roost sites or maternity colonies, during clearing and construction activities. An increased potential for illegal collection of special status species as a result of the establishment and maintenance of access roads will also occur.

Mitigation measures will be implemented to minimize impacts on special-status species, such as minimizing clearing to the extent possible; maintaining buffers around streams and other water bodies that would generally be left intact; installing sediment control devices; revegetating disturbed areas following construction; time-of-year restrictions; preconstruction surveys, construction monitoring, and postconstruction monitoring. Preconstruction surveys in particular are expected to be efficient at reducing direct impacts on aquatic and terrestrial special-status species because surveys will identify the presence of special-status species before site preparation and construction are initiated. In addition, habitat for these species will be restored over time because areas adjacent to the narrower permanent ROW, as well as areas inside the ROW that are not needed to maintain the line, will be allowed to succeed to forest and areas inside the ROW where vegetation is maintained may create additional habitat for some species. To minimize adverse impacts on migratory birds and bald eagles, an Avian Protection Plan has been developed in consultation with the USFWS which includes measures such as installing bird diverters on the lines and post-construction monitoring. With implementation of these mitigation measures, the selected alternative will not impair special-status species or their habitat. Park visitors will continue to have opportunities to enjoy special status species and the parks.

Rare and Unique Communities

The park encompasses a variety of unique ecosystems and geographic sites, resulting in an unusual concentration of resources with varying scope of importance. Rare and unique communities are subject to special management treatment needed to maintain their viability. The alignment for the selected alternative will intersect three park-managed outstanding natural features (Arnott Fen, Hogback Ridge, and Kittatinny Ridge), and five rare and unique vegetation communities (Delaware River riparian corridor, hemlock forests, lichens, talus slopes, and Van Campen Brook riparian area). These communities encompass approximately 52 percent of the route in the study area.

Impacts on rare and unique communities will result from clearing and construction activities such as drilling, excavation and grading, soil compaction, noise, and the physical removal of vegetation. The Delaware River riparian corridor extends approximately 0.25 mile on either side of MDSR, and two towers will be constructed in the riparian corridor. After the double 500-kV transmission line is constructed, a portion of the mature eastern hemlock forest will be permanently altered and maintained as scrub shrub habitat. The construction of the ROW will impact mature forest, primarily eastern hemlock / northern hardwood forest, along the Hogback Ridge. The Hogback Ridge woodlands cover approximately 216 acres but are part of a larger expanse of forested habitat that encompasses approximately 893 acres. The talus slope community on Kittatinny Ridge along the selected alternative

will likely not require clearing because the transmission line will span the community. The Van Campen Brook riparian area and wetland complex lie in the ROW under the selected alternative. Some of the plant species in the wetland are incompatible shrub / small tree species that will be removed by hand clearing for construction and maintenance activities and the construction of a new tower foundation and crane pad will result in the clearing of 0.23 acre of wetland vegetation.

The selected alternative incorporates mitigation measures to avoid and minimize adverse impacts to rare and unique communities such as maintaining a 50-foot buffer surrounding wetlands areas and maintaining a 100-foot buffer within the Delaware River riparian corridor. In addition, all cleared areas except access roads and tower foundations will be seeded after construction with an NPS-approved conservation seed mixture appropriate to the local conditions. Impacts to Arnott Fen will be reduced by elimination of an access road through the southern portion of the fen. The area within the ROW maintained for operation is less than that which will be cleared for constructions and the permanent ROW width will be narrower than the existing ROW. Areas both inside and outside the ROW that do not need to be maintained for operation of the S-R Line will be allowed to succeed to forest over time, which will restore and maintain the integrity of rare and unique communities. Therefore, for the reasons outlined above, these communities will not be impaired. Future visitors will be able to enjoy these communities in similar condition and quality as currently exists.

Archeology

DEWA is identified in the Congressional record for archeological significance. The archeological record in DEWA is significant because of the unique geography of the Water Gap and the pre-Columbian settlers that it attracted, and is unusually complete and contiguous because the area has not suffered disturbance to the same extent as its surroundings. DEWA has the most significant, intact concentration and diversity of known archaeological resources in the northeastern United States, as well as outstanding examples of American Indian and European settlements dating from the Early Woodland through Late Colonial historic periods. Two archeological sites have been identified within the alignment for the selected alternative that could be directly affected by the construction of the transmission line. One site has components that date to the prehistoric period and the historic period. Phase II archeological investigations at this site resulted in a recommendation of National Register eligibility for the prehistoric component only. The second site dates to the prehistoric period; Phase II archeological investigations also resulted in a recommendation of National Register eligibility.

The application of the Advisory Council criteria of adverse effects (36 CFR 800.5, “Assessment of Adverse Effects”) resulted in the finding that the site with both prehistoric and historic period components will not be disturbed. However, protection through engineering controls was recommended as a precaution against inadvertent ground-disturbing activities. It was found that the site containing only prehistoric period components could be adversely affected. Therefore, it was recommended that engineering controls could avoid or minimize ground-disturbing activities to the most significant portions of the site. Archeological resources will be avoided to the greatest extent possible.

The selected alternative includes additional mitigation measures to reduce impacts from construction, operation, and maintenance activities. These measures are outlined in the Section 106 mitigation plan, developed with the consulting parties. In project areas where archeological resources are located, mitigation would include preserving the sites in place by avoiding the disturbance or destruction of potential resources. Site areas might be cordoned off and deliberately avoided by construction activities, thereby preserving the potential resource for future scientific study. If during construction previously unknown archeological resources are discovered, all work in the immediate vicinity of the discovery will be halted until the resources could be identified and documented and, an appropriate mitigation strategy developed. Implementation of these mitigation measures will effectively minimize adverse effects of the

selected alternative on archeological resources. Thus, the preferred alternative will not impair archeological resources because known archeological sites will be avoided for the most part or the effects will be limited to just a portion of the site, and unavoidable adverse effects will be mitigated by data recovery to collect and preserve the important information associated with the site.

Historic Structures

Historic preservation is specifically identified in DEWA's enabling legislation. DEWA is significant because it contains some of the earliest examples of historical structures in the region, with many of the sites still retaining their original appearance and orientation in largely intact surroundings, including historic structures representative of eighteenth-century frontier farms, nineteenth century rural farms and villages, and twentieth-century energy-efficient design. Historic structures are also a major draw for visitation with approximately 44 percent of visitors identifying historic structures as important.

The selected alternative will result in possible effects on 39 identified structures, all known to meet National Register eligibility requirements. With the exception of demolition of the historic B-K Line, none of the effects will be direct physical effects, but will be visual and will vary depending on how the viewshed of the historic structure is affected by clearing or construction of the selected alternative. Visual effects will result from removal or loss of vegetation and from sight of the larger transmission towers and more numerous conductors within the viewshed of the historic structures. The presence of the large towers and lines will diminish the integrity of setting, feeling, and association of numerous historic structures. There were 39 identified historic structures within the APE. At this time it has been determined that the selected alternative could have an adverse effect on at least 17 historic structures within the area of potential effect. The selected alternative will have no adverse effect on 22 historic structures.

Mitigation measures will reduce effects on historic structures from construction, operation, and maintenance activities. Measures will include the placement of trees and other vegetation between the historic architectural resources of the transmission line. Although impacts will be significant to 17 historic resources located within the study area, the selected alternative will not result in impairment to historic structures because this is only a small percentage of the historic structures throughout the parks and those effects will be mitigated by implementing the stipulations outlined in the Section 106 mitigation plan developed with the consulting parties. The parks will continue to serve their purposes as stated in the enabling legislation in reference to historic structures and the cultural integrity of the park will not be diminished. Historic resources throughout the park will still be available for opportunities for enjoyment of the park by future generations.

Cultural Landscape

DEWA, including the portion of APPA found within it, and the MDSR together constitute a cultural landscape. They encompass the Delaware River Valley with all of its architecture, history, pre-history, and traditions and significant natural resources around which that culture is built. DEWA was established to preserve past land uses and as a whole represents a cultural landscape, encompassing the Delaware River Valley with all of its architecture, history, pre-history, and traditions inextricably interwoven with the magnificent natural resources around which that culture was built. DEWA represents the larger cultural landscape which is made up of many individual cultural landscapes. APPA is considered a cultural landscape because of its importance to the environmental and outdoor recreation movements and the visionary and volunteer efforts to create the Appalachian Trail. Within the alignment for the selected alternative there are 64 cultural landscapes identified. Of these 64 cultural landscapes, there are 43 either in the National Register or that meet National Register criteria for listing.

At this time it has been determined that the selected alternative could have an adverse effect on 18 cultural landscapes within the area of potential effect. These cultural landscapes are in close physical proximity to the transmission line corridor, or the alignment will cross the landscape parcel, district, or trail.

To reduce the number of cultural landscapes impacted by construction, operation, and maintenance activities, mitigation measures will be implemented. Measures will include placement of trees and other vegetation between the cultural landscape resources and the transmission line corridor and developing planting plans to screen towers and interpret the historic viewshed of the site. Although impacts to some individual cultural landscapes will be adverse, the selected alternative will not result in impairment to cultural landscapes because only a small portion of the cultural landscapes throughout the parks will be affected and those effects will be mitigated by implementing the stipulations contained in the Section 106 mitigation plan. The cultural landscape of DEWA as a whole will continue to be key to the cultural integrity of the parks and will be available for the enjoyment of future generations.

Visual Resources

Two distinct landforms compose the study area landscape for the selected alternative: the Valley and Ridge physiographic province, including the river lowlands or alluvium-filled basins and the low parallel ridges of the valley, and the Appalachian Plateau province, with its enlarged stream valleys and rounded highlands. DEWA includes over 40 miles of nationally designated scenic river (MDSR) and 27 miles of APPA, plus 100 miles of other trails affording views of streams, ridgetop overlooks, wetlands, and waterfalls (NPS 2010t). The DEWA landscape consists of heavily wooded Pennsylvania and New Jersey uplands, rolling hills of successional forests, open lowlands of the Delaware and Flatbrook valleys, the Delaware River and its tributaries, and lakes (NPS 1987, 13). APPA traces the high points of Kittatinny Ridge along the Pennsylvania and New Jersey state lines, and 27 miles of the trail passes within the DEWA boundary. Much of the trail within the study area is surrounded by forest, so views are frequently limited to the foreground. However, at clearings, the trail's relatively high position affords hikers opportunities for expansive views to the north across the Delaware River Valley or southeast across the continuous forest of rural western New Jersey. The parks contain views that are unusual in this region in extent, vividness, intactness, and unity.

The Organic Act and the enabling legislation for all three park units specifically identify scenery as a key resource. Delaware Water Gap National Recreation Area was established "for preservation of the scenic, scientific, and historic features contributing to public enjoyment" of its lands and waters. Preservation of these resources is identified as the second management priority in DEWA's 1987 GMP, which includes a goal to maintain the park's overall scenic landscape. Also as identified in the GMP, the park's landscape management program includes a goal to conserve the scenic qualities of the recreation area, acknowledging that although "some change in the landscape will be inevitable over the long term, the intent will be to manage change so that it is incremental rather than radical."

The Appalachian Trail Management Principles define the trail as "a way, continuous from Katahdin in Maine to Springer Mountain in Georgia, for travel on foot through the wild, scenic, wooded, pastoral, and culturally significant lands of the Appalachian Mountains." According to the Appalachian National Scenic Trail's comprehensive plan (1981), the trail was originally proposed as "a footway linking the scenic high ridges of the eastern seaboard." The plan also notes that "Open areas and vistas are a particularly pleasing element of the [trail]. Management activities needed to preserve these characteristics are encouraged." According to the plan, the trail has been given a "maximum sensitivity rating" for visual quality.

The selected alternative will have significant adverse impacts on visual resources from construction and operation of the new transmission line. Activities related to deconstruction and construction near Key Observation Points will have adverse impacts on visual resources and scenic views for visitors who use areas near the construction zones while construction is occurring. These adverse impacts will be localized and the severity will depend on the extent to which deconstruction and construction activities can be seen, as well as the location of temporary spur roads. Adverse impacts from operation of the new transmission line include the visible changes of the much taller monopole towers with larger, more numerous conductors and devices such as bird diverters, as well as the cleared ROW. Visibility of the transmission line will not be static, but will vary depending on natural seasonal cycles and vegetation management performed by both the applicant and park staff. The vegetation clearing within the ROW corridor will be seen from various locations within and outside the park, as is the existing ROW corridor (the route will not change). The selected alternative also contributes to adverse cumulative impacts when combined with the adverse impacts of development occurring outside the parks.

Within DEWA, the adverse impacts will be most apparent along Millbrook-Flatbrook Road and Old Mine Road in New Jersey. Affected sites in Pennsylvania potentially include Fernwood Resort, Pennsylvania Hwy 209 near Bushkill, McDade Trail, the cultural landscape related to the Schoonover house, and Community Drive. Affected sites in New Jersey potentially include Van Campen Glen, Hamilton, and Pioneer trails, Watergate Recreation Site, and Millbrook Village. Along APPA, the larger transmission line structure will increase intrusion into what is a relatively unspoiled viewshed.

The selected alternative incorporates measures to reduce or minimize adverse impacts to visual resources, including placing tower structures at the maximum feasible distance from roadway and trail crossings; use of non-reflective neutral colored paints and coatings approved by the NPS to reduce reflection; re-vegetating disturbed areas with approved species; and reducing the permanent cleared ROW to 200 feet. In some areas, replacing the existing lattice towers with monopoles will slightly reduce existing visual clutter. The selected alternative will still result in unavoidable adverse impacts because the larger transmission line structure will remain a visible intrusion that degrades the existing scenic quality of the area that it traverses. However, the adverse impacts of the selected alternative will not impair visual resources. The selected alternative follows the route of the existing transmission line. The narrower width of the permanent ROW corridor, and allowing areas not needed to maintain the line to succeed to forest inside the ROW, will reduce the visibility of the ROW, resulting in a similar appearance to what has been traditionally been seen along the existing line. The larger structure will be visible from more areas in DEWA and along APPA than the existing structure and will be a greater intrusion on APPA visitors that use that section of the trail. The towers within APPA, however, will be wholly within the existing ROW, which will not be expanded within APPA. Overall, the visual resources of the parks will remain intact. Even with the intrusion of the larger transmission line, visitors will be able to enjoy expansive views of relatively natural areas. For these reasons, the selected alternative will not result in impairment of visual resources.

Soundscapes

Soundscapes are an important component of the relatively undeveloped areas traversed by the transmission line within DEWA, APPA and the MDSR. Operation of the proposed transmission line will affect less than 0.5% of the surrounding natural zone, which is considered a small area of disturbance. Directly under the transmission centerline, noise levels will increase 7 to 8 dBA from existing background sound levels, a change that will be readily detectable to the human ear. Within 150 feet of the centerline, noise levels will be reduced, reaching 3 to 4 decibels above existing background sound levels, a change that is barely perceptible to the human ear. These impacts will affect a small amount (less than 0.5%) of the park. Within 350 feet of the centerline, noise levels will be lower than the existing background sound

levels, making the transmission line noise imperceptible. There will be no impact to soundscapes from operation of the selected alternative transmission line beyond 350 feet from the centerline.

Although adverse impacts on soundscapes are minimal, the selected alternative incorporates mitigation measures to ensure that impacts are avoided and minimized to the greatest extent possible. Construction, operation, and maintenance activities will comply with county and city noise ordinances and advanced notice will be given to residences, businesses, and public facilities within the proximity of the study area. To reduce the amount of noise generated from construction equipment, sound control devices and muffled exhaust will be installed. Construction activities will also be limited to daytime hours. With the implementation of mitigation measures, the level of impact will not harm the integrity of the park's soundscapes, including opportunities that will otherwise be present for the enjoyment of the park's soundscapes. Therefore, the selected alternative will not result in impairment of soundscapes.

Wild and Scenic Rivers

The Wild and Scenic Rivers Act defines scenic river areas as those rivers or sections of rivers that are free of impoundments, with shorelines or watersheds still largely primitive and shorelines largely undeveloped, but accessible in places by roads. In 1978 the Delaware River within DEWA was designated as a scenic and recreational river under the Wild and Scenic Rivers Act. MDSR must be managed in accordance with the Wild and Scenic Rivers Act; Section 10(a) of the Act states that each component of the system "shall be administered in such manner as to protect and enhance the values which caused it to be included in [the wild and scenic rivers] system without … limiting other uses that do not substantially interfere with public use and enjoyment of these values. In such administration primary emphasis shall be given to protect [the area's] aesthetic, scenic, historic, archeological, and natural features." As a scenic and recreational river, primary emphasis must be given to protect the river's esthetic, scenic, historic, archeological, and scientific features. The selected alternative corridor will cross MDSR generally perpendicularly at only one location before continuing to the Susquehanna and Roseland substations. The corridor will not follow the river and no access roads are anticipated to be visible from MDSR.

Adverse impacts as a result of the selected alternative will occur primarily on scenic qualities, historic structures, archeological resources, and natural resources. Therefore, many of the values for which the river was designated will be perceptibly changed. Adverse impacts to visual qualities of the river will extend beyond the river itself and will be experienced by visitors who view the river from locations beyond the immediate crossing. The presence of the taller towers, thicker and more numerous lines, and bird diverters will be seen not only as boaters pass below the wires, but as they approach from both upstream and downstream directions. Visitors using river campsites within sight of the lines will be impacted for the duration of their stay at the campsite.

Although adverse impacts to the scenic qualities of the MDSR are expected where the transmission line crosses the river, there will be no impairment of the qualities that caused the river to be included in the wild and scenic river system. As discussed earlier in this determination, no impairment was determined for DEWA's visual resources, which include its esthetic and scenic features, or for DEWA's historic or archeological features. Scientific resources, including water quality, also will not be impaired because construction or disturbance will not occur in the river nor within a 100-foot buffer from the river's edge. Therefore, because none of the resources that receive primary protection as required under the Wild and Scenic Rivers Act will be impaired, no impairment to wild and scenic rivers is expected. The integrity of the MDSR will be maintained, and opportunities for visitors to enjoy the wild and scenic river will continue.